REMARKS

Claims 1-21 and 23-28 are pending.

Request for Withdrawal of the Finality of the Office Action

The applicants respectfully request that the finality of the present Office Action be withdrawn, because it is improper. M.P.E.P. § 706.07(a) states that "[u]nder present practice, second or any subsequent actions on the merits shall be final, *except where the examiner introduces a new ground of rejection that is neither necessitated by applicant's amendment of the claims, nor based on information submitted in an information disclosure statement ....*" The Section 101 rejection of claims 1-10, 21 and 23-28 was presented ***for the first time*** in the present Office Action and thus represents "a new ground of rejection." The Section 101 rejection ***was not necessitated by*** any amendments submitted by the applicants (the applicants did not amend the claims in the last reply dated Oct. 9, 2008). Nor was the Section 101 rejection necessitated by any IDS filed by the applicants. Consequently, the finality of the Office Action is improper and should be withdrawn.

Claim Rejections under 35 U.S.C. § 101

Independent claims 1 and 21 have been amended to address the Examiner's objections to claims 1-10 and 21, 23-28 under Section 101. No new matter is added by these amendments. As amended, these claims are directed to statutory subject matter. Reconsideration is respectfully requested.

Claims 11-20 are indicated in paragraph 4 of the Office Action as "fall[ing] under a statutory class of producing a tangible result." Accordingly, no amendments have been made to those claims.

Claim Rejections under 35 U.S.C. §102

The Examiner has maintained the rejection of claims 1-21 and 23-28 under 35 U.S.C. §102(b) as being anticipated by non-patent literature titled "ARIES: A Transaction Recovery Method Supporting Fine-Granularity Locking and Partial Rollbacks Using Write-Ahead Logging," by C. Mohan et al., ACM Transactions on Database Systems, vol. 17, no. 1, March

1992, pages 94-162 (hereinafter referred to as "Mohan"). Reconsideration is respectfully requested.

As explained in response to the previous Office Action, Mohan does not teach "marking the changed data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store," as recited in each of independent claims 1, 11 and 21. As explained in the specification at paragraphs [0027] – [0034], this enables a system that allows "lazy-commits" of transactions to still provide a "durable read" of data subject to a lazy commit to applications that want a durable read of that data. The Examiner's attempt to read the claimed "marking" step on the writing of the LSN field of a data page, as described in Mohan, is misplaced.

Specifically, in paragraph 2 of the Office Action, the Examiner "interprets the LSN field as marking the change data page to indicate the transaction log buffer (*i.e.,* log record) has yet to be flushed to a persistent data store." But the LSN field of a data page does nothing to indicate whether a particular log record (or an entire log buffer) has been flushed to persistent storage. The LSN field of a data page simply provides a sequence number that associates the changed page with its corresponding log record in the transaction log buffer. The applicants provide a good description of LSNs in paragraph [0023] of the present specification:

> [0023] For every change that is written to any of the data pages 214, a corresponding log record describing the change is written 230 to the transaction log buffer 210 (step 2). Every log record generated is given a sequence number referred to as a Log Sequence Number (LSN). This LSN is also written 248 to the data page 204 in an attribute called Page LSN 250 (step 3). Page LSN means the LSN of the last log record corresponding to the last change made to the page.

Mohan provides the same description of LSNs on page 96 (Section 1.1):

> To meet transaction and data recovery guarantees, ARIES records in a *log* the progress of a transaction, and its actions which cause changes to recoverable data objects . . . Every log record is assigned a unique *log sequence number (LSN)* when that record is appended to the log. The LSNs are assigned in ascending sequence. Typically, they are the *logical* addresses of the corresponding log records.

(*italics* in original). But the LSN field of a data page (*i.e.,* the "Page LSN" attribute) does not in any way indicate whether the transaction log buffer, or any particular record in that buffer,

has been flushed to persistent storage. That is why in the claimed method, the changed data page is marked to indicate that the transaction log buffer containing the log record for that page has yet to be flushed to persistent storage. Mohan does not teach or suggest such a step, which is not surprising because Mohan does not appear to address the problem solved by the applicants – how to provide a "durable read" in a system that allows "lazy commits" of transactions.

In asserting that the LSN field of a data page is the same as the claimed "marking" step, the Examiner further asserts that "The Examiner believes that it is inherent that when log records are written that they are written to a persistent data store." That is incorrect. Log records are first saved to a transaction log buffer in memory (volatile storage), and it is only when that log buffer is flushed that the records in the buffer are written to a persistent data store. Mohan explains this very clearly at the bottom of page 96 (Section 1.1):

> Whenever log records are written, they are placed first only in the *volatile* storage (*i.e.,* virtual storage) buffers of the log file. Only at certain times (*e.g.,* at commit time) are the log records up to a certain point (LSN) written, in log page sequence, to stable storage. This is called *forcing* [or flushing] the log up to that LSN.

(*italics* in original). Thus, the Examiner's belief "that it is inherent that when log records are written that they are written to a persistent data store," is incorrect.

Because Mohan fails to teach or suggest the claimed step of "marking the changed data page to indicate that the transaction log buffer has yet to be flushed to a persistent data store," as recited in each of independent claims 1, 11 and 21, those claims are not anticipated by Mohan. Inasmuch as the remaining claims depend from one of those independent claims, they too are not anticipated by Mohan for the same reason. Withdrawal of the Section 102 rejection of claims 1-21 and 23-28 is respectfully requested.

CONCLUSION

For all the foregoing reasons, the applicants respectfully submit that the present application is now in condition for allowance.

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